Miscellaneous new species of *Hibbertia* (Dilleniaceae) from the wheatbelt and pastoral areas of Western Australia

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Abstract

Wheeler, J.R. Miscellaneous new species of *Hibbertia* (Dilleniaceae) from the wheatbelt and pastoral areas of Western Australia. *Nuytsia* 15(2): 139–152 (2002). The new taxa, *Hibbertia ancistrophylla* J.R. Wheeler, *H. ancistrotricha* J.R. Wheeler, *H. avonensis* J.R. Wheeler, *H. lepidocalyx* J.R. Wheeler, *H. lepidocalyx* subsp. *tuberculata* J.R. Wheeler and *H. stenophylla* J.R. Wheeler are described, mapped and illustrated. All belong to either section *Pleurandra* (Labill.) Benth. or section *Hemipleurandra* Benth. They are recorded from the Avon Wheatbelt, Jarrah Forest and Mallee regions of the South West Botanical Province and the Coolgardie, Murchison and Yalgoo regions of the Eremaean Province.

Introduction

During research on the genus *Hibbertia* Andr., a number of new taxa have come to light. This paper, which is one of a series on the genus *Hibbertia* (Wheeler 2000, 2002a–d), validates new names from the wheatbelt and pastoral areas of Western Australia. The taxa all belong to either section *Pleurandra* (Labill.) Benth. or section *Hemipleurandra* Benth. (Bentham 1863). Terminology of indumentum and leaf shape follows that used in earlier papers (Wheeler 2000). Only one of the new taxa is currently considered to have conservation priority, but the response of each taxon to *Phytophthora* attack has not been documented.

Taxonomy

Hibbertia ancistrophylla J.R. Wheeler, *sp. nov.*

Species propria foliis uncinatis pungentibus, floribus subsessilibus, sepalis et bracteis glabriusculis mucronatis, staminibus 8–11 unilateralibus, staminodiis absentibus, carpellis 2 pilosis 4-ovulatis.

Typus: 21 km west of Mollerin on Burakin–Wialki road, Western Australia, 20 July 1989, *J.R. Wheeler* 2634 (*holo:* PERTH 06130518; *iso:* AD, CANB, K, MEL).

Shrub to 0.6 m high; branchlets glabrous. *Leaves* alternate to spirally arranged, sessile, linear, 2–8 mm long, 0.7–1(1.5) mm wide, thick with the margins closely revolute to the enlarged midrib, glabrous or with sparse uncinate hairs particularly towards the margins, sometimes with minute appressed hairs towards the base of the upper surface, smooth or with occasional tubercles, apparent margins thick and rounded to somewhat compressed, apex recurved with a pale pungent curved mucro. *Flowers* terminating short shoots, 7–12 mm diam., sessile or subsessile with very short peduncles to 3 mm long. *Bracts* 1–5 below each flower, narrowly ovate to ovate or elliptic, 1–2.5 mm long, glabrous, often ciliolate, mucronate. *Sepals* 5, elliptic, subequal or the innermost slightly longer, 3.5–5.5 mm long, outer surface glabrous or with minute v-shaped semi-stellate hairs particularly on the inner sepals, inner surface glabrous or with small appressed hairs particularly in the upper half, often minutely ciliolate; outer sepals 2–3 mm wide, apically keeled to a short pungent mucro; inner sepals broader, 2.5–3.5 mm wide, obtuse but sometimes minutely mucronate. *Petals* 5, deep yellow, obovate, 5–8 mm long, emarginate. *Stamens* 8–11, basally fused, all on one side of the carpels; filament 0.5–1 mm long; anther narrowly oblong, *c.* 1.5 mm long; staminodes absent. *Carpels* 2, more or less globular to obovoid, with white simple hairs; style erect, *c.* 1.5 mm long, glabrous; ovules (2)4 per carpel. *Fruitlets* not seen mature. (Figure 1)

Selected specimens examined (all PERTH). WESTERN AUSTRALIA: vicinity of Perkolilli Waterhole, 30°42'S, 121°39'E, 18 June 1975, *J.S. Beard* 7407; between Caron and Latham, between Wongan Hills and Morowa, 24 Sep. 1931, *W.E. Blackall* 762; 8 km E of Walgoolan between Merredin and Southern Cross, 22 Aug. 1939, *W.E. Blackall* 4015; Nature Reserve no. 28715, 20 km N of Hyden, 6 Sep. 1984, *J.M. Brown* 150 (duplicate AD *n.v.*); 16.7 km from Moorine Rock towards Perth along Great Eastern Highway, 10 Sep. 1968, *E.M. Canning* WA/68 2676 (duplicate CBG *n.v.*); 1 km E of big breakaway on Williamson Rd, Flint's Farm, 50 km NE of Hyden, 9 July 2000, *J.M. Flint* 169; 9.4 km W of Stewart on Westrail line towards Koolyanobbing, Coolgardie District, 29 Aug. 1997, *G. Flowers & S. Donaldson* GF110 (duplicate CBG *n.v.*); *c.* 6 miles [9.3 km] SE of Kulja along road to Koorda, 29 Sep. 1971, *R.D. Hoogland* 12042 (duplicates CANB, HBG, K, L. MEL, UC, US all *n.v.*); Bonnie Rock–Burakin road, 3 km E of junction with Koorda–Kulja road, 17 Sep. 1999, *J.W. Horn* 2502 (duplicate DUKE *n.v.*); both sides of Kondinin–Narembeen road, 4.5 km S of its junction with Bendering East Rd, 22 Sep. 2001, *J.W. Horn* 4101 (duplicate DUKE, *n.v.*).

Distribution. Western Australia, South West and Eremaean Botanical Provinces, IBRA regions Avon Wheatbelt, Mallee and Coolgardie. Recorded from between Wubin and Paynes Find south to near Hyden and east to Coolgardie. (Figure 2A)

Habitat. Occurs in shrubland or heath, recorded mostly from sand, but occasionally from clay or lateritic soil.

Phenology. Flowers June to October; mature fruits not seen.

Conservation status. Widespread and quite common, not believed to be under threat.

Etymology. From the Greek *ancistron* – fish-hook and *phyllon* – leaf, referring to the strongly hooked leaf apex.

Affinities. The position of the stamens all on one side of the carpels and the absence of staminodes indicates that *Hibbertia ancistrophylla* belongs to the section *Pleurandra*. *Hibbertia ancistrophylla* resembles *H. eatoniae* Diels in its strongly hooked small leaves and in its hairy and usually 4-ovulate

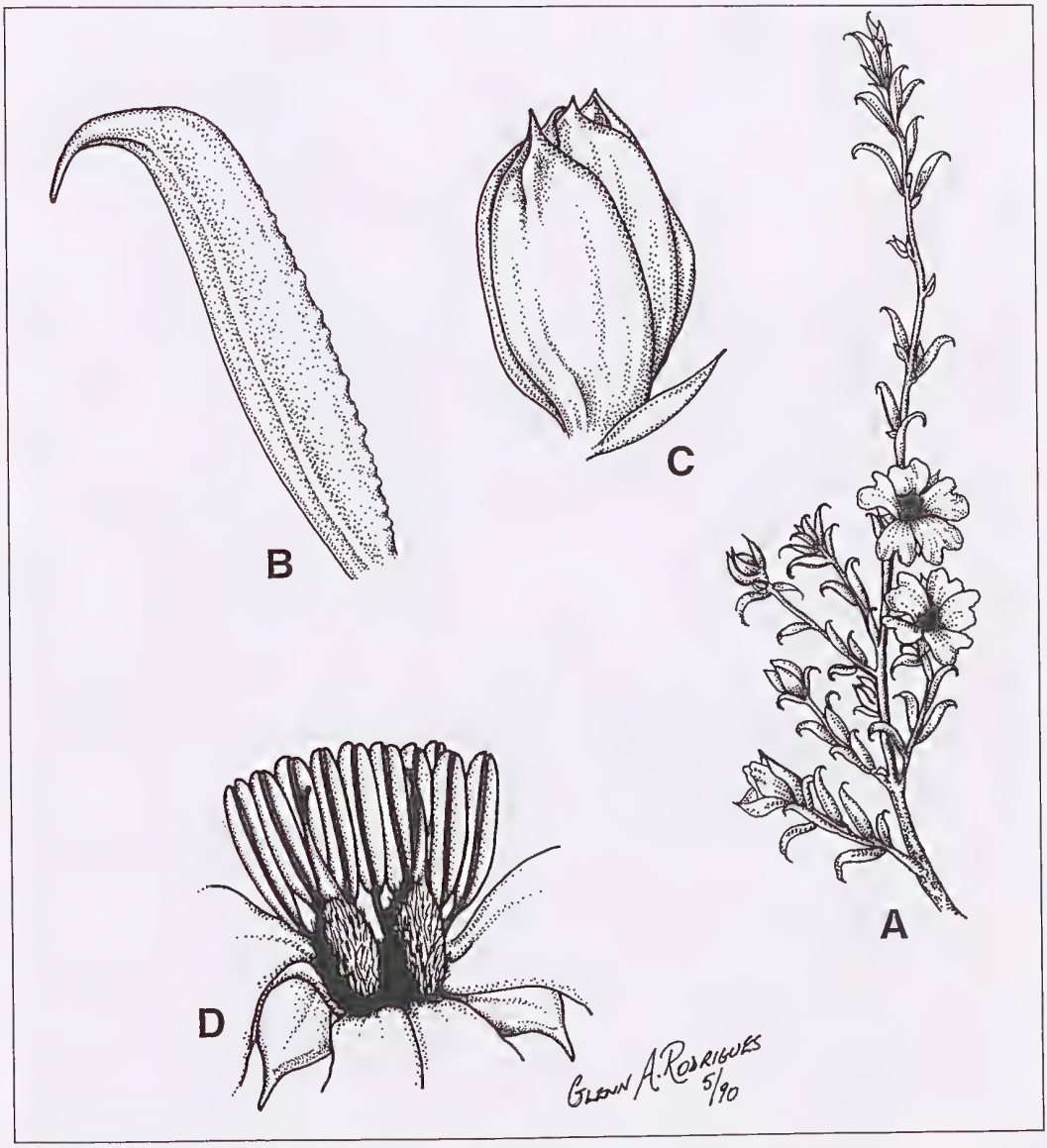

Figure 1. *Hibbertia ancistrophylla*. A – flowering branch (x2), B – leaf (x8), C – bud showing sepals and bract (x10), D – stamens and carpels (x10). Drawn by Glenn Rodrigues.

carpels, but differs in its sessile or subsessile flowers, and almost glabrous bracts and sepals. *Hibbertia eatoniae* has leaves with short scale-covered petioles, prominently pedunculate flowers, scale-covered to stellate-hairy bracts and sepals which are not or scarcely mucronate and carpels covered with stellate hairs.

Notes. Previously known by the phrase name *Hibbertia* sp. *Kulja* (*J.R. Wheeler* 2581). A specimen from between Wubin and Paynes Find has obtuse outer sepals which lack the mucronate apex. Two collections (*J.M. Brown* 150, *J.M. Flint* 169) from near Hyden have 2 rather than 4 ovules per carpel.

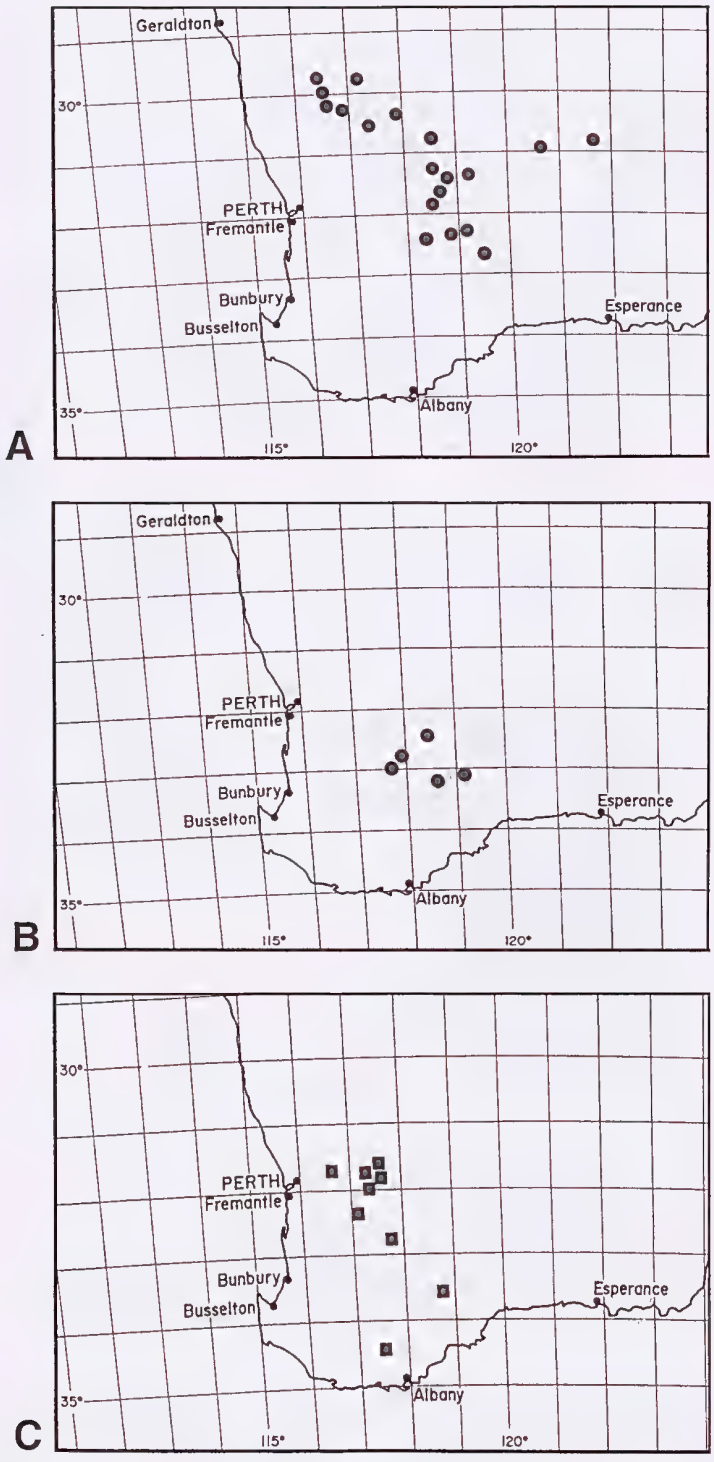

Figure 2. Distribution maps. A – *Hibbertia ancistrophylla*; B – *Hibbertia ancistrotricha*; C – *H. avonensis*.

Hibbertia ancistrotricha J.R. Wheeler, *sp. nov.*

Species foliis crassis rigidis breviter pungentibus, floribus breviter pedunculatis, bractea anguste triangulari, sepalo pilis uncinatis, staminibus 10(12) unilateralibus, staminodiis absentibus, carpellis 2 pilosis 4-ovulatis.

Typus: east of Dudinin, gravel pit 1.5 km east of Dudinin on the Dudinin–Kulin road, Western Australia, 11 October 2001, *J.R. Wheeler* 4149 (*holo:* PERTH 06130526; *iso:* AD, CANB, K, MEL, NSW).

Shrub to 1.3 m high; branchlets glabrous or with minute simple or v-shaped semi-stellate hairs and glabrescent. *Leaves* spirally arranged, spreading, subsessile to very shortly petiolate; petiole up to 0.5 mm long, with minute dense simple or semi-stellate hairs; blade narrowly oblong to linear, 2.5–8 mm long, 0.8–1.2(1.5) mm wide, thick with the margins tightly recurved to a more or less level or slightly sunken midrib, glabrescent, the young leaves with very occasional uncinate hairs, upper surface very minutely reticulate to papillose, apparent margin rounded, apex obtuse but the midrib extended as a fairly thick and rigid very short mucro up to 0.2 mm long. *Flowers* solitary and axillary, 8–15 mm diam., shortly pedunculate; peduncle 2–8 mm long, with sparse semi-stellate to stellate hairs. *Bracts* several at base of peduncle and 1 immediately below the flower; uppermost bract broader than lower bracts, very narrowly triangular, 1.5–2.5 mm long, herbaceous, the margin and upper surface with sparse simple and uncinate hairs, acute. *Sepals* 5, basally fused, dark green tinged red, elliptic, subequal or the innermost slightly longer, 4–5 mm long; outer sepals 1.8–2.5 mm wide, with a prominent midrib, hairy with uncinate hairs, long-acute, ciliolate; inner sepals *c.* 3 mm wide, with a less prominent midrib, hairy with uncinate hairs and also some minute stellate or semi-stellate hairs towards the broad almost glabrous margins, shortly acuminate, ciliolate. *Petals* 5, bright yellow, obovate, 4–7 mm long, apically notched. *Stamens* 10(12), fused basally and all on one side of the carpels; filament *c.*1 mm long; anther narrowly oblong, 1.5–2 mm long, obtuse, opening by longitudinal slits; staminodes absent. *Carpels* 2, globular, densely hairy; style more or less erect, 1–1.5 mm long; ovules 4 per carpel. *Fruitlets* obovate, not seen mature. (Figure 3A–F)

Selected specimens examined (all PERTH): WESTERN AUSTRALIA: Newdegate, between Lake Grace and Lake King, 7 Nov. 1931, *W.E. Blackall* 1295; VCL Site 4 quadrat 1, just SW of Harrismith, 25 Nov. 1999, *E. Bennett & T. Sleep* 4.004; VCL Site 4 quadrat 1, just SW of Harrismith, 25 Nov. 1999, *E. Bennett & T. Sleep* 4.008; gravel pit, 500 m E of Dudinin on Kulin–Dudinin road, 7 May 1997, *R. Davis* 3135; both sides of Bendering Reserve Rd, 7.1 km W of its junction with Karlgarin Hill North Rd, 22 Sep. 2001, *J.W. Horn* 4109; Heathland Nature Reserve east of Lake Grace, along southern boundary, 14 Nov. 1994, *E.D. Kabay* 1064; Harrismith, edge of townsite on Wickepin–Harrismith road, 11 Oct. 2001, *J.R. Wheeler* 4144 (duplicates AD, K, MEL); Harrismith, on road to airfield, 11 Oct. 2001, *J.R. Wheeler* 4147; Harrismith, railway reserve, just N of townsite, 11 Oct. 2001, *J.R. Wheeler* 4150.

Distribution. Western Australia, South West Botanical Province, IBRA regions Avon Wheatbelt and Mallee. Recorded from Bendering and the Dudinin–Harrismith area east to Newdegate. (Figure 2B)

Habitat. Recorded from clay or loam and often gravelly soils in heath or shrubland.

Phenology. Flowers September to November, but also recorded for May.

Conservation status. Reasonably restricted in distribution, but occurring in a nature reserve where it was described as locally common.

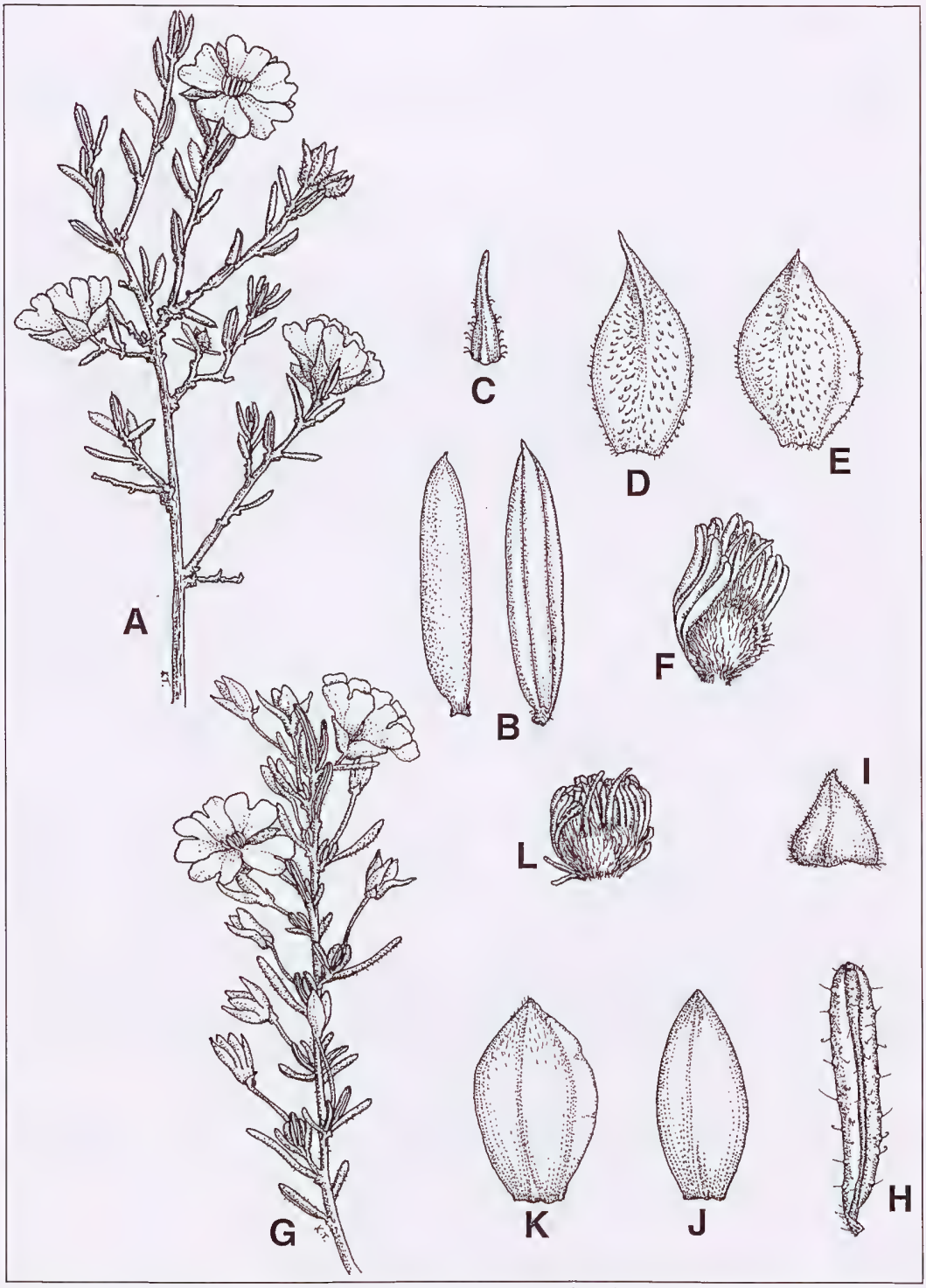

Figure 3. A–F. *Hibbertia ancistrotricha*. A – flowering branch (x2), B – leaf (x8), C – bract (x10), D – outer sepal (x8), E – inner sepal (x8), F – stamens and carpels (x8); G–L. *Hibbertia avonensis*. G – flowering branch (x2), H – lower surface of leaf (x8), I – bract (x10), J – outer sepal (x8), K – inner sepal (x8), L – stamens, staminodes and carpels (x10). Drawn by Kath Trafalski from *J.R. Wheeler* 4144 (A–F) and *J.R. Wheeler* 2618 (G–L).

Etymology. From the Greek *ancistron* – a fish hook and *trichon* – a hair, referring to the numerous uncinate hairs on the sepals.

Affinities. *Hibbertia ancistrotricha* belongs in section *Pleurandra*, having stamens all on one side of the 2 carpels and lacking staminodes. Often found growing with *Hibbertia acerosa* (DC.) Benth., which may also have uncinate hairs on the calyx and leaves, but *H. acerosa* has a longer leaf with a longer and more slender mucro, flowers with staminodes on each side of the fertile anthers and only 2 ovules per carpel.

Hibbertia avonensis J.R. Wheeler, *sp. nov.*

Species foliis brevibus crassis obtusis tuberculatis pilis dispersis strictis vel uncinatis, floribus breviter pedunculatis, sepalis exterioribus fere glabris, sepalis interioribus minute hirtis pilis simplicibus vel stellatis, staminibus 10(15) unilateralibus, staminodiis utrinque staminum, carpellis 2 pilosis 2-ovulatis.

Typus: c. 9 miles [14.2 km] east of Pingrup, Western Australia, 9 October 1971, *R.D. Hoogland* 12101 (*holo:* PERTH 03034224; *iso:* CANB, HBG, K, L, NSW, UC all *n.v.*).

Shrub to 0.6 m high; branchlets with minute simple hairs but soon glabrescent. *Leaves* spirally arranged, somewhat spreading, subsessile or with an indistinct petiole up to 0.5 mm long, narrowly oblong an thick, 2.5–8 mm long, 0.8–1.4 mm wide, margin revolute to a sunken midrib, the apparent margin rounded, upper surface tuberculate with a simple, long, straight to uncinate hair arising from each tubercle, the margin of the midrib apparently papillose, apex obtuse and minutely apiculate, the apiculum often downcurved. *Flowers* solitary in the upper axils or terminating very short axillary shoots, 7–13 mm diam.; peduncle 2–10 mm long, glabrous or with sparse appressed simple hairs. *Bracts* 1–3 at the base of the peduncle hidden amongst the leaves and 1 at the top of the peduncle immediately below the flower; uppermost bract ovate to broadly ovate, 1–2 mm long, base rounded to cordate, apex subacute to acute, margin ciliolate, otherwise glabrous. *Sepals* 5, basally fused, elliptic, subequal, 3.5–6 mm long; outer sepals 2–2.5 mm wide, subacute to obtuse, shallowly keeled, minutely ciliolate, otherwise glabrous apart from occasional sparse apical hairs; inner sepals broader, 2.5–3 mm wide, more obtuse, with minute appressed simple to semi-stellate or stellate hairs, margin thin and ciliolate. *Petals* 5, bright yellow, obovate, 4–8 mm long, deeply emarginate. *Stamens* 10(15), basally fused, all on one side of the carpels with 2 or 3 staminodes on each side of the stamens; filament *c.* 1 mm long; anther narrowly oblong, (1)1.5 mm long, obtuse or apiculate; staminode linear to subulate, 0.5–1.5 mm long. *Carpels* 2, more or less globular, 1–1.5 mm diam., white-hairy with simple hairs; style erect, 1.2–1.5 mm long; ovules 2 per carpel. *Fruitlets* obovate, *c.* 2.5 mm long, 1.5–2 mm wide; seed brown, globular, 1.5–2 mm diam. with a small waxy aril. (Figure 3G–L)

Selected specimens examined (all PERTH). WESTERN AUSTRALIA: Reserve 16262, Martagallup–Tenterden road, 12 km WNW of Kendenup, 21 Sep. 1993, *A.R. Annels* 3705; Reserve No. 19412, Site 3, N of Harrismith on both sides of the railway, within the Toolibin catchment, 24 Nov. 1999, *E. Bennett & T. Sleep* 19412.15; Quairading, 5 Oct. 1933, *W.E. Blackall* 3262; Tammin, Sep. 1922, *C.A. Gardner* 671a; Northam, Oct. 1900, *J.H. Gregory s.n.*; N side of the Great Eastern Highway, 4.0 km W of its junction with Tammin–Wyalkatchem Road in Tammin, 1 Sep. 2001, *J.W. Horn* 4029 (duplicate DUKE *n.v.*); W side of Ralston Rd, 14.25 km S of its junction with Goldfields Rd, Charles Gardner Reserve, 1 Sep. 2001, *J.W. Horn* 4032 (duplicate DUKE *n.v.*); Tammin National Park, 15 miles [24 km] S of Tammin, 2 Aug. 1968, *R.D. Royce* 8429; 4 km W of Tammin along Great Eastern Highway, 15 Sep.

1982, *A. Strid* 20304; 9 km W of Northam, 23 Sep. 1988, *J.R. Wheeler* 2618 (duplicates AD, CANB, MEL).

Distribution. Western Australia, South West and Eremaean Botanical Provinces, IBRA regions Avon Wheatbelt and Jarrah Forest. Recorded from Northam and Tammin to Pingrup with a southerly record from near Kendenup. (Figure 2C)

Habitat. Occurs in heath, shrubland or occasionally in woodland, predominantly on sand but with occasional records from loam or gravelly clay.

Phenology. Flowers recorded August to October, fruits recorded for November.

Conservation status. Fairly widespread, not believed to be under threat.

Etymology. The name of this species reflects its occurrence in the southern wheatbelt and is almost entirely restricted to the Avon Wheatbelt region.

Affinities. With all its stamens on one side of 2 carpels and with the presence of staminodes *Hibbertia avonensis* belongs in the section *Hemipleurandra*. Previously often included in *Hibbertia gracilipes* Benth. to which it is similar in its small thick leaves which are obtuse and somewhat apiculate, its pedunculate flowers and 2-ovulate carpels but differs in its indumentum, stamens and staminodes. *Hibbertia gracilipes* has glabrous leaves and sepals, longer peduncles, apiculate anthers and lacks staminodes.

Note. One of the specimens of *Hibbertia avonensis* was recognised as distinct over 70 years ago by C.A. Gardner who annotated a specimen (*Gardner* 671a) by the manuscript name "*Hibbertia gracilipes* var. *tamminensis* Gardner" with a short Latin diagnosis dated 19 December 1929 and a note saying "Form of *H. gracilipes* or a new species". However I can find no publication of this name.

Hibbertia lepidocalyx J.R. Wheeler, *sp. nov.*

Species foliis strictis mucrone recto pungenti ad apicem instructis, floribus pedunculatis, sepalis lepidotis, staminibus 9–10 unilateralibus, staminodiis absentibus, carpellis 2 lepidotis 4–6-ovulatis.

Typus: 7 km east of Lake King township, Western Australia, 9 August 1968, *P.G. Wilson* 6951 (*holo:* PERTH 04395654; *iso:* AD, K).

Shrub to 0.75 m high; branchlets glabrous apart from sparse stellate hairs on very young growth. *Leaves* spirally arranged, sometimes forming clusters on short shoots; petiole 0.5–1 mm long, upper surface with tiny hairs, the lower surface with dense appressed scales; blade rigid, linear but thick with margins revolute to the midrib, (5)6–20 mm long, 1–1.5 mm wide, leaf surface smooth or tuberculate, glabrous or with very sparse minute stellate or v-shaped semi-stellate hairs towards the base, apparent leaf margin thick and rounded, apex with a straight pungent mucro 0.5–1 mm long. *Flowers* solitary, axillary, 8–25 mm diam., pedunculate and sometimes at length nodding; peduncle 4–15 mm long, with sparse stellate hairs; *Bracts* several at base of peduncle and 1 immediately below flower; uppermost bract ovate, 2–3.2 mm long, acute, outside covered with dense scales, margin minutely fringed. *Sepals* 5, basally fused, ovate to elliptic, subequal, 4–7 mm long, 2.5–5 mm wide, outside covered with scales,

the inside of the outermost sepals with minute appressed hairs; outer sepals subacute to obtuse; inner sepals obtuse, broader with a thin glabrous but minutely ciliolate margin. *Petals* 5, yellow, obovate, 5–12 mm long, deeply emarginate. *Stamens* 9–10, all on one side of the carpels and basally fused; filament 0.5–1.5 mm long; anther narrowly oblong, 1.5–2 mm long; staminodes absent. *Carpels* 2, more or less ovoid, densely covered with appressed scales whose margins are sometimes fringed; style 1–2 mm long, with sparse stellate hairs towards the base; ovules 3–6. *Fruitlets* obovoid, *c.* 3 mm long, 1.8 mm wide; seeds brown, ellipsoid, *c.* 2 mm long, *c.* 1.3 mm wide, with a small waxy aril, often only one maturing.

Etymology. From the Greek *lepidos* – scale and *calyx* – covering of a flower or fruit, referring to the scales covering the calyx.

Affinities. Hibbertia lepidocalyx, with its stamens all on one side of the 2 carpels and the absence of staminodia, belongs in section *Pleurandra*. Related to *Hibbertia eatoniae* Diels, with similar pedunculate flowers, sepals covered in scales and carpels each with 4–6 ovules. However *H. eatoniae* has smaller leaves with occasional scabrous hairs and a distinctly recurved mucro. The indumentum of both the sepals and carpels but particularly the carpels in *H. eatoniae* approaches that of stellate hairs with a fused centre rather than fringed scales.

Notes. Two subspecies are recognised.

Key to subspecies of *Hibbertia lepidocalyx*

1. Leaf surface apparently smooth. Flowers 8–15 mm diam. (Mallee region) ... subsp. **lepidocalyx**

1. Leaf surface distantly tuberculate. Flowers 15–25 mm diam. (Coolgardie region) ..... subsp. **tuberculata**

Hibbertia lepidocalyx subsp. **lepidocalyx**

Leaves appearing smooth, up to 15 mm long, 1–1.4 mm wide, mucro *c.* 0.5 mm long. *Flowers* 8–15 mm in diameter. *Sepals* 4–7 mm long, 2.5–3 mm wide; outer sepals subacute. *Petals* 5–9 mm long. *Ovules* 3 or 4(5) per carpel. (Figure 4A–F)

Other specimens examined (all PERTH). WESTERN AUSTRALIA: E side of gridline (and W of mine waste dump) just N of crossroads *c.* 250 m NW of Hatter Hill, 5 Sep. 1996, *N. Gibson & K. Brown* 2521 (duplicate AD); on N side of gridline just off Middle Ironcap Rd, *c.* 400 m E of South Ironcap, 7 Sep. 1996, *N. Gibson & K. Brown* 3055; to the S of gridline, 100 m E of Middle Ironcap Rd, *c.* 600 m E of South Ironcap, 7 Sep. 1996, *N. Gibson & K. Brown* 3056; to W of cleared strip, *c.* 50 m E of Hatter Hill, 3 Sep. 1996, *N. Gibson & K. Brown* 3057; N side of Bendering Reserve Rd, 2.4 km SW of its junction with Narembeen South Rd, Shire of Kondinin, 22 Sep. 2001, *J.W. Horn* 4106 (duplicate DUKE *n.v.*); powerline right-of-way running in a N–S direction on the N side of Lake King–Norseman road, 1.4 km E of its junction with Hyden–Lake King road in Lake King, 24 Sep. 2001, *J.W. Horn* 4118 (duplicate DUKE *n.v.*); Baanga Hill, E of Lake King, 11 Aug. 1986, *R.A. Saffrey* 445; 3.1 km E of Lake King on road to Norseman, 21 Sep. 1986, *J.R. Wheeler* 2415 (duplicate MEL); near Baanga Hill, junction of Hatter Hill Rd and Baanga Hill Rd, 22 Sep. 1986, *J.R. Wheeler* 2421(duplicate CANB); lower east-facing slopes of South Ironcap at HYD66 benchmark, 7 Sep. 1999, *J.R. Wheeler* 3964 (duplicates MEL, NSW).

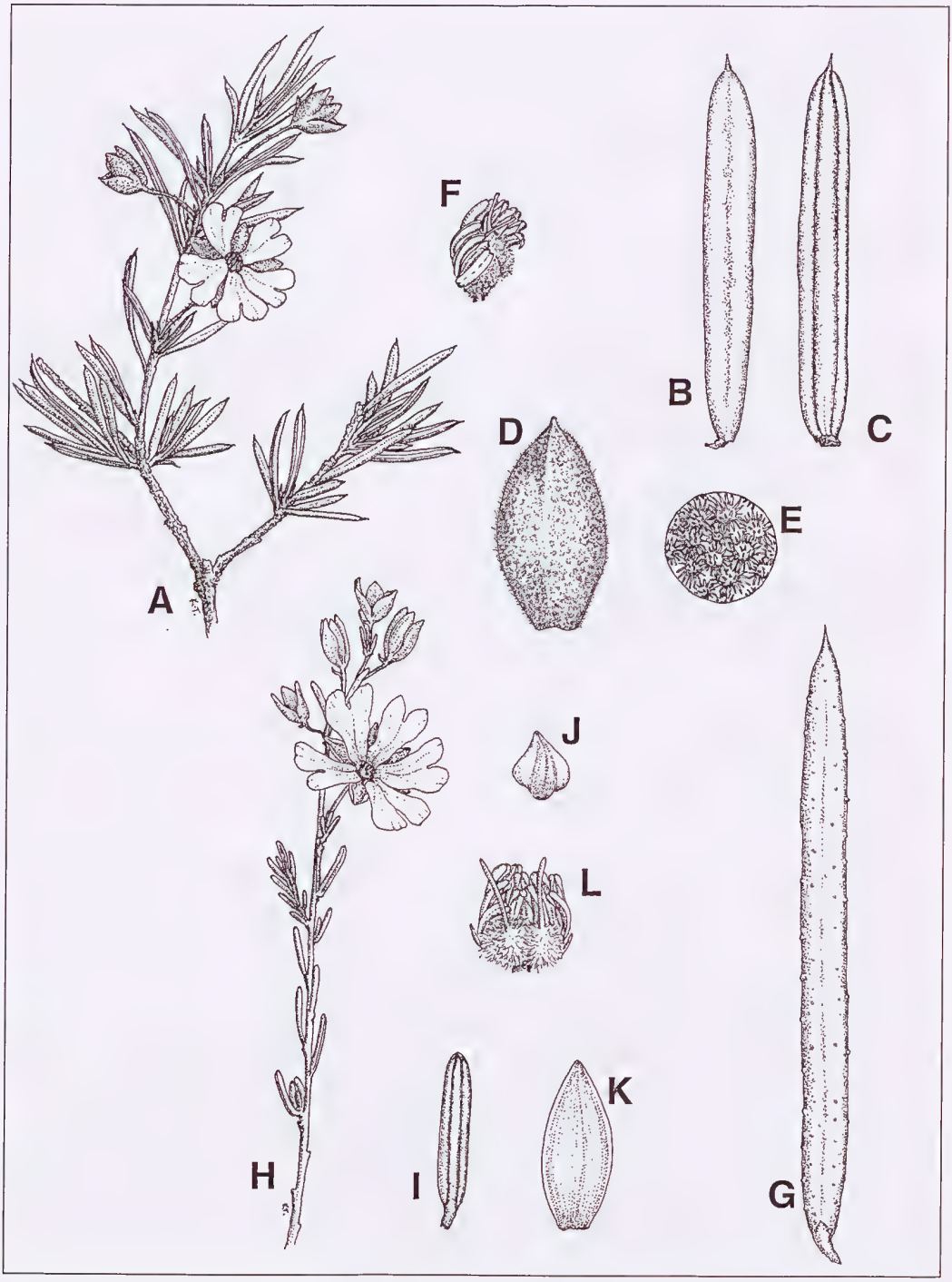

Figure 4. A–F. *Hibbertia lepidocalyx* subsp. *lepidocalyx*. A – flowering branch (x2), B – upper surface of leaf (x8), C – lower surface of leaf (x8), D – outer sepal (x8), E – enlargement of sepal indumentum (x20), F – stamens and carpels (x8); G – *Hibbertia lepidocalyx* subsp. *tuberculata*, upper surface of leaf (x8); H–L. *Hibbertia stenophylla*. H – flowering branch (x2), I – lower surface of leaf (x8), J – bract (x 20), K – outer sepal (x8), L – stamens, staminodes and carpels (x10). Drawn by Kath Trafalski from *J.R. Wheeler* 2416 (A–F), *Gibson & Lyons* 3748A (G), *C. Robinson* 532 and *J.S. Beard* 4676 (H–L).

Distribution. Western Australia, South West Botanical Province, IBRA region of Mallee. Recorded from Bendering and east of Lake King, from South Ironcap to Baanga Hill. (Figure 5A)

Habitat. Recorded in open mallee or shrubland on lateritic soil over laterite, or sandy loam or sandy clay with lateritic gravel.

Phenology. Flowers recorded August to September; occasional fruits recorded in September.

Conservation status. Locally quite common, not believed to be under threat.

Hibbertia lepidocalyx subsp. **tuberculata** J.R. Wheeler, *subsp. nov.*

Subspecies haec a subsp. *lepidocalyce* foliis tuberculatis et floribus grandioribus differt.

Typus: on north side of track between Kurrajong and Pittosporum rockholes, *c.* 17.2 km north-north-west of Mt Dimer, Hunt Range, Jaurdi Station, Western Australia, 18 July 1995, *N. Gibson & M. Lyons* 2507 (*holo:* PERTH 05293731; *iso:* AD, CANB, K).

Leaves up to 20 mm long, 1.2–1.5 mm wide, distantly tuberculate, each small tubercle topped by a microscopic stellate or semi-stellate hair, apex a mucro 0.5–1 mm long. *Flowers* 15–25 mm diam. *Sepals* broadly elliptic, 6.5–7 mm long, 3.5–5 mm wide, all obtuse. *Petals* 9–12 mm long. *Ovules* (5)6 per carpel. (Figure 4G)

Other specimens examined (all PERTH). WESTERN AUSTRALIA: N side of track *c.* 10.3 km NE of Bungalbin Hill, Aurora Range, 24 July 1995, *N. Gibson & M. Lyons* 2790; 100 m N from end of track *c.* 8.5 km NE of Bungalbin Hill, Aurora Range, 24 July 1995, *N. Gibson & M. Lyons* 2881; ridge *c.* 1.5 km N of Bungalbin Hill, 23 July 1995, *N. Gibson & M. Lyons* 3748A (duplicate MEL).

Distribution. Western Australia, Eremaean Province, IBRA region of Coolgardie. Recorded only from the Aurora Range and the Hunt Range. (Figure 5A)

Habitat. Recorded from woodland and heath on loam soils of a banded ironstone ridge.

Phenology. Flowers recorded for July; mature fruits not seen.

Conservation status. Conservation Codes for Western Australian Flora: Priority One. Apparently restricted in distribution and in need of surveying.

Etymology. From the Latin *tuberculatus* – tuberculate, referring to the wart-like projections on the upper surface of the leaves.

Affinities. Hibbertia lepidocalyx subsp. *tuberculata* differs from the typical subspecies in its slightly longer leaves with distinct small tubercles and its somewhat larger flowers with broader more obtuse sepals. The rank of subspecies has been chosen for this taxon as it is geographically distinct from subsp. *lepidocalyx*.

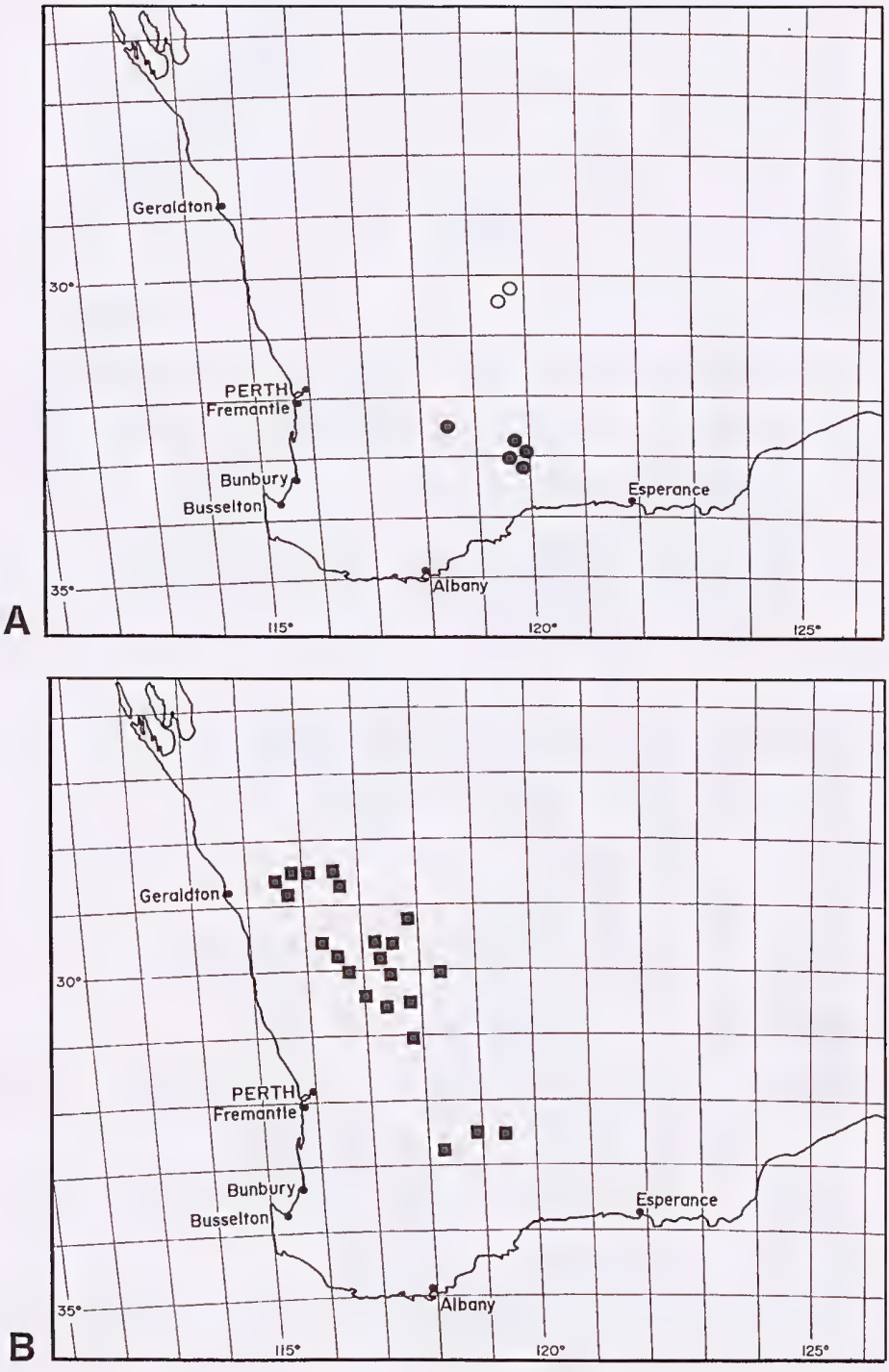

Figure 5. Distribution maps. A – *H. lepidocalyx* subsp. *lepidocalyx* ● and *H. lepidocalyx* subsp. *tuberculata* ○ ; B – *H. stenophylla*.

Hibbertia stenophylla J.R. Wheeler, *sp. nov.*

Species foliis angustis obtusis, marginibus recurvis ad costam depressam; floribus breviter pedunculatis, bractea cordata, sepalis glabris, staminibus 10 unilateralibus, staminodiis utrinque staminum, carpellis 2 pilosis 3–4-ovulatis.

Typus: on west side of Black Rd, 1.3 km north of intersection with Glamroff Rd in locality of Goodlands, *c.* 61 km north-east of Kalannie, Western Australia, 30 July 1994, *M. Hislop* 31 (*holo:* PERTH 04306171; *iso:* AD, K).

Shrub to 0.6(1) m high; branchlets glabrous. *Leaves* spirally arranged, shortly petiolate, usually antrorsely directed, rarely spreading; petiole (0.3)0.5–1 mm long, glabrous; blade linear but thick and appearing terete, (1.5)2.5–9(12) mm long, 0.5–0.8(1.5) mm wide, glabrous, smooth or very minutely tuberculate, margins revolute to a sunken midrib, apparent margins rounded, apex obtuse and sometimes minutely apiculate. *Flowers* solitary in the upper axils or terminating short shoots, shortly pedunculate, (5)10–15(20) mm diam.; peduncle 1–4.5 mm long, rarely apparently absent in immature flowers, glabrous. *Bracts* 2–4 at the base of the peduncle and 1 immediately below flower; uppermost bract broadly ovate and cordate, with a dark and somewhat keeled midline and paler margins, 0.5–0.8(1.2) mm long, 0.7–1 mm wide, glabrous, margin irregularly indented and rarely minutely ciliolate, apex acute to subacute. *Sepals* 5, basally fused, subequal or the innermost slightly longer, 4–6 mm long, glabrous with a distinct pale margin, obtuse; outer sepals elliptic, 2–3 mm wide; inner sepals broadly elliptic, 3–4.5 mm wide. *Petals* 5, yellow, obovate, (3)5–10(12) mm long, the apex deeply notched. *Stamens* 10 all on one side of the carpels, basally fused, usually with 1–3 staminodes on each side of the stamens; filament *c.* 1 mm long; anther narrowly oblong, *c.* 1.5 mm long, obtuse; staminodes subulate, 1–1.5 mm long, usually lacking an anther. *Carpels* 2, more or less globular, densely hairy with simple white hairs; style erect, 1.5–2 mm long, sometimes hairy towards the base; ovules 3 or 4 per carpel. *Fruitlets* obovoid to oblong obovoid, 2.5–3.5 mm long, *c.* 1.5 mm wide, hairy; seeds 1 or 2 maturing per carpel, brown, globular, 1.5–2 mm diam., partly surrounded by a large waxy aril which often extends about halfway up the seed. (Figure 4H–L)

Selected specimens examined (all PERTH). WESTERN AUSTRALIA: between Latham and Maya, 3 Sep. 1938, *W.E. Blackall* 3750; 40 km E of Mullewa on road to Yalgoo, 14 May 1968, *H. Demarz* 50; 20 km S of Rabbit Proof Fence near Emu Rock, 17 Sep. 1976, *R.J. Hnatiuk* 760857; SW side of Struggle St, 2.2 km N of junction with Kalannie Road, Shire of Dalwallinu, 15 Sep. 1999, *J.W. Horn* 2459 (duplicate DUKE *n.v.*); road between Mullewa and Morowa, c. 10 km S of Mullewa, 9 Aug. 1973, *A. Kanis* 1614 (duplicate CANB *n.v.*); western boundary of Badja Station [south of Yalgoo], 27 June 1993, *A.L. Payne* 3613; 19 km E of Karroun Hill, 1983, *P. Roberts* 224; 30 km E of Dalwallinu on road to Kalannie, 19 Sep. 1988, *J.R. Wheeler* 2575 (duplicates AD, CANB, MEL); 5 km W of Mollerin on Burakin–Wialki road, 20 July 1989, *J.R. Wheeler* 2632 (duplicates AD, K, MEL, NSW); near Lake Moore, E side, *c.* 51 km N of Cleary, 2 Sep. 1967, *P.G. Wilson* 6123 (duplicate MEL).

Distribution. Western Australia, South west and Eremaean Botanical Provinces, IBRA regions Avon Wheatbelt, Murchison, Yalgoo and Coolgardie. Recorded from Mullewa and Yalgoo east to Karroun Hill and south to Kulin and near Hyden. (Figure 5B)

Habitat. Recorded from heath and shrubland on a variety of soils.

Phenology. Flowers recorded May to September; fruits from September.

Conservation status. Widespread, not believed to be under threat.

Etymology. From the Greek *stenos* – narrow and *phyllon* – leaf, referring to the small narrow leaves.

Affinities. With the stamens all on one side of the carpels and the presence of staminodes this species belongs to section *Hemipleurandra*. It is possibly related to *Hibbertia crassifolia* (Turcz.) Benth., but with the foliage and sepals completely glabrous, with shortly pedunculate flowers and 3- or 4-ovulate carpels. Superficially resembling some forms of *Hibbertia gracilipes* Benth. but differing in its obtuse anthers and presence of staminodes, the 3- or 4-ovulate carpels and in the form of the leaves which, in *H. gracilipes,* are tightly revolute to a somewhat enlarged midrib.

Notes. A single flower was noted with 3 carpels, but the third carpel was withered and probably infertile. One collection (*F.M. Sharr s.n.*) from Pindar had 6 staminodes outside the fertile stamens rather than 1–3 each side.

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References

Bentham, G. (1863). Dilleniaceae. *In:* "Flora Australiensis" Vol. 1, pp. 16–48. (Reeve: London.)

Thackway, R. & Cresswell, I.D. (1995). (eds) An interim biogeographic regionalisation for Australia: a framework for establishing the national system of reserves, version 4.0. Published Report of the Australian Nature Conservation Agency: Canberra.

Wheeler, J.R. (2000). Review of *Hibbertia mucronata* and its allies (Dilleniaceae). *Nuytsia* 13(2): 379–394.

Wheeler, J.R. (2002a). A review of *Hibbertia glomerosa sens. lat.* (Dilleniaceae). *Nuytsia* 14(3): 411–418.

Wheeler, J.R. (2002b). Two new species of *Hibbertia* section *Candollea* (Dilleniaceae) from the south west of Western Australia. *Nuytsia* 14(3): 419–426.

Wheeler, J.R. (2002c). Three new subspecies of *Hibbertia glomerata* (Dilleniaceae) from the Darling Range, Western Australia. *Nuytsia* 14(3): 427–435.

Wheeler, J.R. (2002d) A revision of *Hibbertia depressa* and its allies (Dilleniaceae) from Western Australia. *Nuytsia* 15(1): 127–138.